

54S Rapid Paced Paper Sessions

RR25.

Infracarpal Upper Extremity Arterial Bypass: Is it Worth it?

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Objectives: Patients presenting with digital ischemia and arterial occlusion distal to the wrist are a disadvantaged population with renal failure, collagen vascular disease and hypercoagulable states and difficult technical options for revascularization. A nonaggressive stance to treatment in these patients often leads to significant digit/hand loss and thus we have approached these patients aggressively in order to try to improve limb salvage.

Methods: A retrospective review of all upper extremity bypasses performed to arteries distal to the wrist was performed. All patients were evaluated with biplanar arteriography. Patients with hypercoagulable states and rheumatoid arthritis/collagen vascular disease (RA) were medically evaluated prior to operation. Postoperative surveillance was performed with PVR and Duplex scan. Vein bypasses were performed in all cases. Patency was computed according to life table methods.

Results: Between 1993 and 2008, 40 bypasses were performed in 34 patients for digital gangrene (20), rest pain (13) and ulcer (5). There were 19 males and 15 females. Patient risk factors included diabetes (17), active smoking (17), hypertension (13), hyperlipidemia (8), Coronary disease (10) and renal failure (18). Documented hypercoagulable states and RA were present in four and 12 patients, respectively. Outflow arteries included distal radial (29), distal ulnar (1), palmar arch (7) and common digital arteries (3). Venous conduit included saphenous and cephalic veins in reversed (34), nonreversed (3) and spliced (3) configuration. There was no operative mortality. Digital amputation was performed in 19 patients for gangrene and minor debridement in 4 patients. There were 5 bypass occlusions all of which occurred in the first year. Cumulative patency from this point on was 84% (mean follow up: 22 months (range: 1-184 months)). Cumulative survival was 57% at 2 years and 26% at 5 years.

Conclusions: Arterial bypass in patients with infracarpal upper extremity arterial disease is challenging but may be achieved with excellent patency. Digital amputation is often required. Long term survival in these patients is limited and perioperative management of patient risk factors important.

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RR26.

Natural History of Mesenteric Artery Stent Restenoses and Clinical and Anatomic Predictors for Re-intervention in Patients with Chronic Mesenteric Ischemia

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Objectives: To determine the natural history, clinical and anatomical predictors of mesenteric artery stent (MAS) restenosis in patients with chronic mesenteric ischemia (CMI).

Methods: The clinical data of 102 patients treated with 127 MAS for CMI was entered into a prospective database (2001-2006). Data was reviewed in 87 patients (57 female, 30 male; median age 77 years) with imaging follow up >3months (mean 28±22 months). Pre-procedure computed tomography angiography (CTA) with centerline of flow analysis and biplanar angiography were reviewed to determine anatomic measurements. Mesenteric restenosis was defined as >60% restenosis by CTA, angiography or duplex ultrasound. Univariate and logistic regression analysis was performed to identify factors associated with restenosis.

Results: There were 71 SMA and 35 celiac stents. Forty-seven patients (54%) developed restenosis. Symptomatic restenoses in 17 patients (13 chronic, 4 acute) were treated with re-intervention (12 endovascular, 3 open) in all except 2 patients who died of unrelated causes. Asymptomatic restenoses in 30 patients (23 with angiographic confirmation) were followed for 30±25 months: 4 (13%) developed symptoms (3 chronic, 1 acute) and 8 had re-interventions (4 prophylactic). There were no deaths associated with re-interventions and 82 patients (94%) referred symptom improvement at their last visit. Freedom from restenosis, recurrence and re-intervention at 3-years was 35±6%, 65±7% and 65±7%. Primary and secondary patency rates were 60±7% and 86±5% at same intervals. There were more (P<.05) restenoses in female patients (63% vs 37%), and those with occlusions (100% vs 46%), severe calcification (80% vs 40%), longer lesions (>30mm, 71% vs 52%) and vessel diameter <7mm (63% vs 21%). Occlusions and severe calcification were independently associated with higher risk of restenosis (P <.01).

Conclusion: MAS restenoses occur in approximately half of the patients, of which half develop recurrent mesenteric ischemia. Our results support a conservative approach for asymptomatic restenosis and a policy of

early re-intervention in the presence of symptoms. Patients with longer or calcified lesions and those with residual post-procedure stenosis have the highest re-intervention rates.

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RR27.

Visceral Artery Duplex Ultrasound Velocity Criteria for Instent Stenosis Following Mesenteric Artery Stenting: Validated with Arteriography

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Objectivjs: The number of patients undergoing endovascular therapy for mesenteric ischemia is rapidly increasing. The accuracy of mesenteric duplex ultrasound (DUS) has not been established for the prediction of in-stent restenosis (ISR) of the celiac (CA) or superior mesenteric artery (SMA). The purpose of this study is to determine DUS velocity criteria for mesenteric stents.

Methods: A retrospective review all consecutive patients that underwent endovascular stenting from July 2004 to July 2008 was completed. The angiography (DSA) and DUS were performed within three months of each other to be considered paired measurements. Standard statistical analysis was performed.

Results: There were 53 SMA and 17 CA ultrasound and angiography pairs. CA analysis of receiver operator curves (ROC) showed no discrimination between DUS and greater than 70% stenosis on DSA, p=0.65. Using all CA paired studies, a velocity of 226 cm/s has a sensitivity of 1 and specificity of 0.33 and a velocity of 449 cm/s has a sensitivity of 0.50 and specificity of 0.87 (Table 1). SMA analysis of ROC curves showed an AUC of 0.74 between DUS and greater than 70% stenosis on DSA, p=0.007. Using all paired SMA studies, a velocity of 302 cm/s has a sensitivity of 1 and specificity of 0.5 and a velocity of 645 cm/s has a sensitivity of 0.27 and specificity of 1 (Table 1).

Conclusions: Duplex ultrasound grading of stent restenosis for mesenteric vessels has not been validated. Superior mesenteric artery stent stenosis can be diagnosed with good sensitivity and PPV using DUS. This data can help guide the decision to perform arteriography for specific DUS velocities of mesenteric stents.

Table 1. Celiac Artery ROC Analysis

DUS (cm/s)	Sensitivity	Specificity	PPV	NPV
226	1	0.33	0.17	1.00
263	0.50	0.40	0.10	0.86
337	0.50	0.47	0.11	0.88
350	0.50	0.53	0.13	0.90
365	0.50	0.67	0.17	0.91
425	0.50	0.73	0.20	0.92
449	0.50	0.87	0.33	0.93
460	0.50	0.93	0.50	0.93

Table 2. Superior mesenteric artery ROC analysis

DUS (cm/s)	Sensitivity	Specificity	PPV	NPV
302	1	0.48	0.23	1
320	1	0.50	0.23	1
335	0.86	0.50	0.21	0.96
343	0.86	0.52	0.21	0.96
362	0.71	0.52	0.19	0.92
375	0.71	0.57	0.20	0.93
403	0.57	0.65	0.20	0.91
417	0.43	0.67	0.17	0.89
462	0.43	0.76	0.21	0.90
482	0.43	0.80	0.25	0.90
506	0.43	0.85	0.30	0.91
525	0.43	0.87	0.33	0.91
549	0.43	0.91	0.43	0.91
609	0.27	0.98	0.67	0.90
645	0.27	1	1	0.90